

粘土地盤の破壊問題への弾・粘塑性構成式の適用

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| 雑誌名 | 平成7(1995)年度 科学研究費補助金 一般研究(C) 研究成果報告書概要 |
| 巻 | 1994 1995 |
| ページ | 2p. |
| 発行年 | 1997-03-03 |
| URL | http://doi.org/10.24517/00066413 |



1995 Fiscal Year Final Research Report Summary

Role of a constitutive model in the stability problem of clay

Research Project

Project/Area Number

06650533

Research Category

Grant-in-Aid for General Scientific Research (C)

Allocation Type

Single-year Grants

Research Field

Geotechnical engineering

Research Institution

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Project Period (FY)

1994 – 1995

Keywords

clay / failure / constitutive model / strength anisotropy / strength parameters / limit analysis / finite element method / foundation

Research Abstract

In this research project we have derived the strength parameters to be obtained from various kind of laboratory and field tests on clay. The basic idea is in the development of an elastic-viscoplastic constitutive model of incremental type. Especially we have paid attention in analysing the strength parameters to be obtained from the constant-volume-shear-box tests and the field vane tests both of which are relatively inexpensive and

yet are not widely used in engineering practice for a reason that their theoretical backgrounds are not well-established. In addition to the purely theoretical derivation of the strength parameters, we have developed computer programs to simulate the 3-dimensional soil/water coupling problems associated with the failure of clay. This FEM program requires a super-computer to solve the problems. By using the FEM program developed for 3-D soil/water coupling problems based on an elasto-viscoplastic constitutive model, constant-volume-shear-box tests and field vane tests are successfully simulated. The results are in good accordance with the tests on various kind of clays collected from over this country.

Research Products (13 results)

All Other

All Publications (13 results)

- [Publications] Hideki OHTA, etc: "PROGRESSIVE FAILURE OF SOIL CLAY UNDER EMBANKMENT" INTERNATIONAL CONFERENCE ON SOIL MECHANICS AND FOUNDATIONS ENGINEERING. Vol.2. 751-754 (1994) ▼
- [Publications] 太田秀樹 他: "軟弱地盤の応力状態の評価手法とその適用性" 土木学会論文集. No.487 III-26. 217-226 (1994) ▼
- [Publications] 杉江茂彦 他: "粘土地盤におけるベーンせん断強度の発現メカニズム" 土木学会論文集. No.487 III-26. 227-236 (1994) ▼
- [Publications] 出村禧典 他: "軟弱地盤上構造物の上・下部構造一体システムを用いた最適化" 土木学会論文集. No.505 III-29. 171-180 (1994) ▼
- [Publications] Sighiko SUGIE etc: "Pore water migration during plane strain triaxial test." Compression and Consolidation of Clayey Soils. Vol.1. 189-194 (1995) ▼
- [Publications] Hideki OHTA, etc: "New loading system of pressuremeter." The pressuremeter and its New Avenues. 367-372 (1995) ▼
- [Publications] Ohta, H., Iizuka, A., Monda, S., Kuwabara, M. and Muta, T.: "Progressive Failure of Soft Clay under Embankment." Proceedings of the International Conference on Soil Mechanics and Foundation Engineering. Vol.2. (1994) ▼
- [Publications] Zhao Yan, Iizuka Atsushi and Hideki Ohta.: "Settlement Prediction of Reclined Land in Kasaoka." The 28th Japan National Conference on Soil Mechanics and Foundation Engineering. (1993) ▼
- [Publications] Sugie, S., Iizuka, A. and Ohta, H.: "Non-Linear Soil/Water Coupled Formulation and Choice of Element Type Used in Deformation/Stability Analysis." Proceedings of the International Conference on Computational Methods in Structural and Geotechnical Engineering. Vol.4. (1994) ▼
- [Publications] Kurihara, N., Ohta, H., Isoda, T. and Sekiguchi, H.: "Settlement Performance of the Central Hokkaido Expressway Built on Peat." Proceedings of the International Workshop on Advances in Understanding and Modelling the Mechanical Behavior of Peat. (1994) ▼
- [Publications] Sugie, S., Iizuka, A. and Ohta, H.: "Pore Water Migration during Plane Strain Triaxial Test" Proceedings of the International Symposium on Compression and Consolidation of Clay Soils. Vol. 1. (1995) ▼
- [Publications] Fukagawa, R., Aoyagi, T., Ohta, H., Morita, Y., Kashiwagi, A. and Honda, T.: "Pressuremeter Tests under Various Overburden Pressure." Proceedings of the 4th International Symposium-The Pressuremeter and its New Avenues.(1995) ▼
- [Publications] Ohta, H., Fukagawa, R., Kashiwagi, A., Hata, K. and Tsutiya, H.: "New Loading System of Pressuremeter." Proceedings of the 4th International Symposium-The Pressuremeter and its New Avenues.(1995) ▼

URL: https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-06650533/066505331995kenkyu_seika_hokoku_

Published: 1997-03-03